



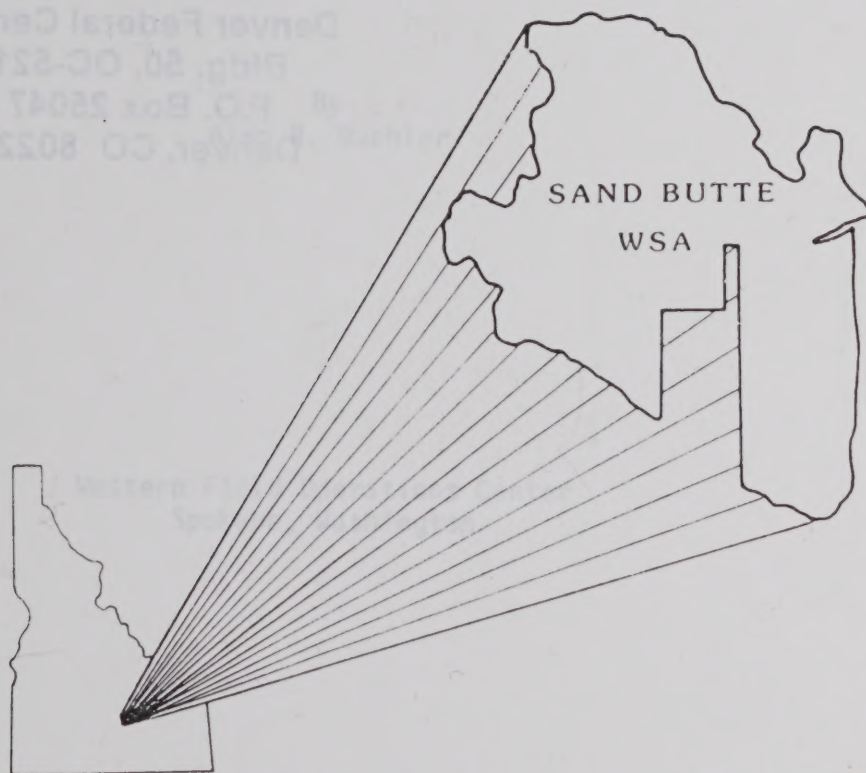
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Open File Report

Mineral Resources of the Sand Butte Wilderness Study Area, Lincoln County, Idaho



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The Federal Land Policy and Management Act of 1976 (Public Law 94-579, Sec. 603, October 21, 1976) requires the U.S. Geological Survey and U.S. Bureau of Mines to conduct mineral surveys on U.S. Bureau of Land Management administered lands "... prior to any recommendation for the designation as wilderness ... to determine the mineral values, if any, and may be present ...". Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of the mineral survey of the Sand Butte Wilderness.

MINERAL RESOURCES OF THE SAND BUTTE
WILDERNESS STUDY AREA, LINCOLN COUNTY, IDAHO

By
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Spokane, Washington

This open-file report will be summarized in a joint report published by the U.S. Geological Survey. The data were gathered and interpreted by Bureau of Mines personnel from Western Field Operations Center, L. 360 (Inter Agency Agreement, 1978). The report has been edited.

UNITED STATES DEPARTMENT OF THE INTERIOR
Donald P. Hodel, Secretary

BUREAU OF MINES
Robert C. Horton, Director

PREFACE

The Federal Land Policy and Management Act of 1976 (Public Law 94-579, Sec. 603, October 21, 1976) requires the U.S. Geological Survey and U.S. Bureau of Mines to conduct mineral surveys on U.S. Bureau of Land Management administered land "... prior to any recommendation for the designation as wilderness ... to determine the mineral values, if any, that may be present" Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a Bureau of Mines mineral survey of the Sand Butte Wilderness Study Area (ID-57-8), Lincoln County, ID.

ILLUSTRATIONS

- Figure 1. Location of the Sand Butte Wilderness Study Area (ID-57-8).
2. Location of decorative stone resources in the Sand Butte Wilderness Study Area (ID-57-8), ID.

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ILLUSTRATIONS

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Setting

Sand Butte WSA encompasses 20,790 acres of a basaltic lava field in the Snake River Plain of southern Idaho. The WSA is now administered by the Snake River District of the BLM. The center of the WSA is about 15 mi (about) south-southwest of Carey (Fig. 1). Unimproved roads and jeep trails provide access to most of the boundary (Fig. 2). A dirt road penetrates just over a mile into the WSA from the eastern boundary. The WSA is separated by dirt roads from the adjacent Raven's Eye WSA, which was studied concurrently (Quinlan and Hoyle, 1986).

1/ WSA (Wilderness Study Area): a roadless area or forest that has been inventoried by the U.S. Bureau of Land Management and found to have wilderness characteristics as described in Section 603 of the National Land Management Act of 1976 and Section 2(c) of the Wilderness Act (78 Stat. 891).

SUMMARY

A mineral survey of the 20,792-acre Sand Butte WSA (Wilderness Study Area), ID-57-8, was conducted by U.S. Bureau of Mines personnel in 1985, at the request of the Bureau of Land Management. The WSA is in Lincoln County, south-central Idaho, about 15 miles south-southeast of Carey. There are no mines, prospects, or claims within the WSA. Basaltic lava is the only rock type exposed within the WSA. The only mineral resource is a few tons of a platy variety of lava (slab pahoehoe) which is suitable for use as decorative stone. Similar slab pahoehoe, produced from other lava fields in southern Idaho, retails for approximately \$125/ton. The deposit in the WSA is too small to be mined commercially but may have value to consumers who gather their own decorative stone.

INTRODUCTION

A mineral survey of the Sand Butte WSA (Wilderness Study Area) ^{1/} was conducted in June 1985 by the USBM (U.S. Bureau of Mines) and the USGS (U.S. Geological Survey) at the request of the BLM (U.S. Bureau of Land Management). The USBM examines individual mines, prospects, claims, and mineralized zones, and evaluates identified mineral and energy resources. The USGS evaluates potential for undiscovered resources based on areal geological, geochemical, and geophysical surveys. Results of the investigations will be used to help determine the suitability of the WSA for inclusion into the National Wilderness Preservation System. The immediate goal of this and other USBM mineral surveys is to provide data to the President, Congress, government agencies, and the public for land-use decisions. The long-term objective is to ensure the Nation has an adequate and dependable supply of minerals at a reasonable cost.

Setting

Sand Butte WSA encompasses 20,792 acres of a basaltic lava field in the Snake River Plain of southern Idaho. The WSA is on land administered by the Shoshone District of the BLM. The center of the WSA is about 15 mi (miles) south-southeast of Carey (fig. 1). Unimproved roads and jeep trails provide access to most of the boundary (fig. 2). A dirt road penetrates less than a mile into the WSA from the eastern boundary. The WSA is separated by dirt road from the adjacent Raven's Eye WSA, which was studied concurrently (Buehler and Moyle, 1986).

^{1/} WSA (Wilderness Study Area): a roadless area or island that has been inventoried by the U.S. Bureau of Land Management and found to have wilderness characteristics as described in Section 603 of the Federal Land Policy and Management Act of 1976 and Section 2(c) of the Wilderness Act (78 Stat. 891).

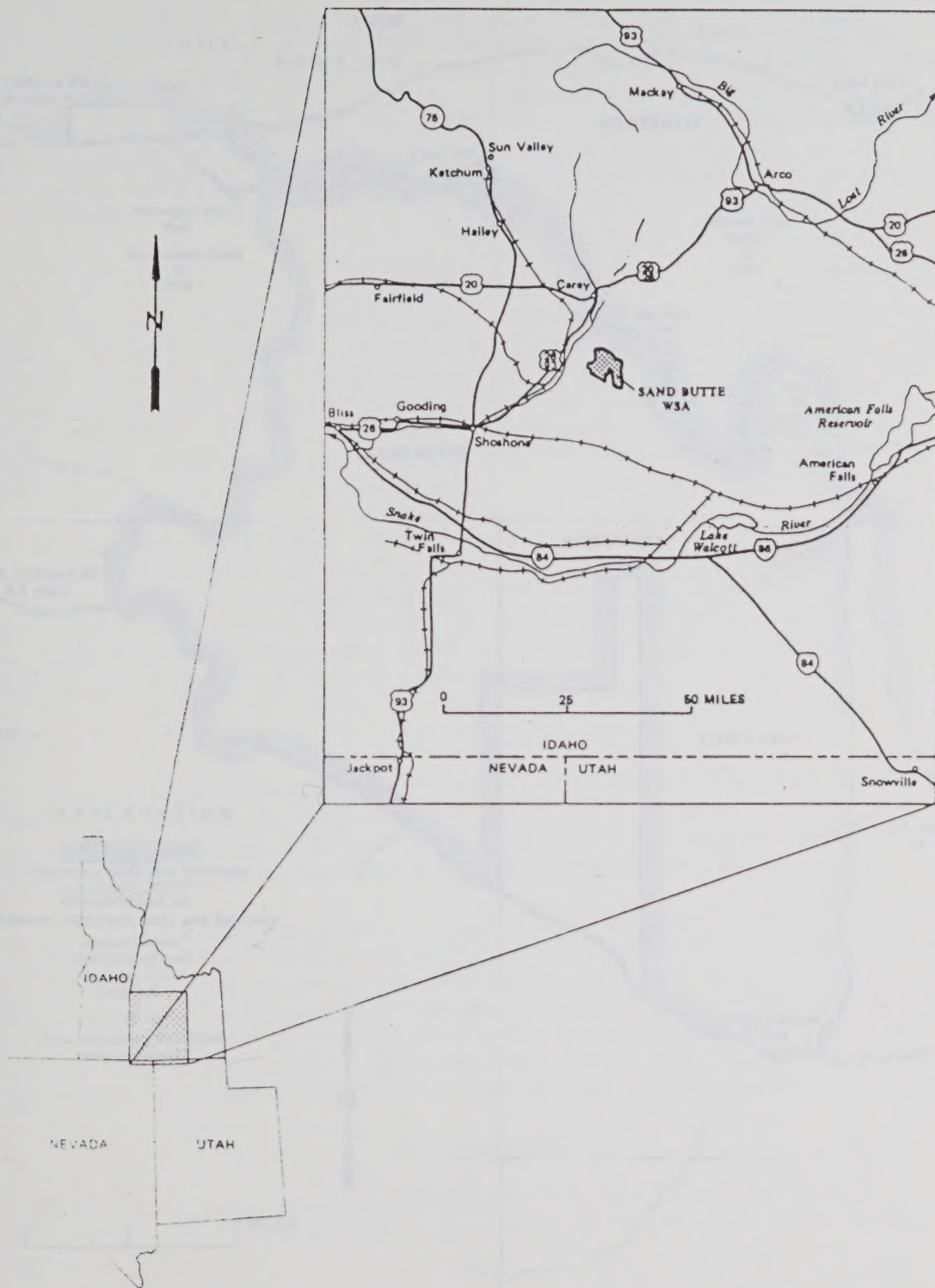


FIGURE 1.— Location of the Sand Butte Wilderness Study Area (ID-57-8), ID

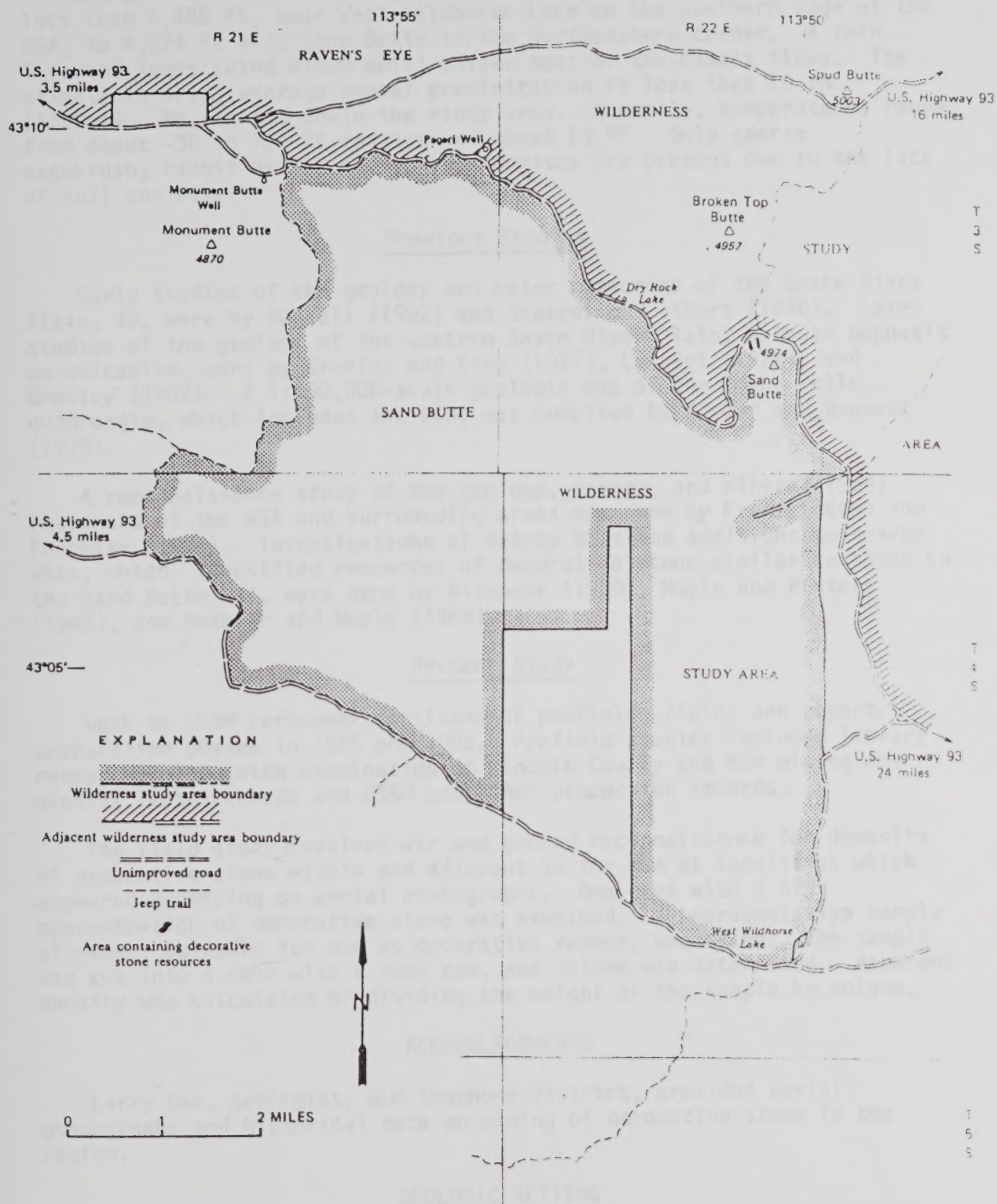


FIGURE 2. — Location of decorative stone resources in the Sand Butte Wilderness Study Area (ID-57-8), ID

Overall relief is about 500 ft (feet); elevations range from slightly less than 4,480 ft, near West Wildhorse Lake on the southern edge of the WSA, to 4,974 ft atop Sand Butte in the northeastern corner. A thin layer of loess (wind blown soil) covers most of the basalt flows. The climate is arid; average annual precipitation is less than 10 in. (inches). No streams drain the study area. Annually, temperatures range from about -30 to 105 °F and average about 53 °F. Only sparse sagebrush, rabbit brush, and various grasses are present due to the lack of soil and water.

Previous Studies

Early studies of the geology and water resources of the Snake River Plain, ID, were by Russell (1902) and Stearns and others (1938). Later studies of the geology of the eastern Snake River Plain, with an emphasis on volcanism, were by Greeley and King (1977), LaPoint (1977), and Greeley (1982). A 1:250,000-scale geologic map of the Idaho Falls quadrangle, which includes the WSA, was compiled by Rember and Bennett (1979).

A reconnaissance study of the geology, energy, and mineral (GEM) resources of the WSA and surrounding areas was done by Fredericksen and Fernette (1983). Investigations of nearby WSAs and additions to nearby WSAs, which identified resources of decorative stone similar to those in the Sand Butte WSA, were done by Ridenour (1980), Moyle and Winters (1985), and Buehler and Moyle (1986).

Present Study

Work by USBM personnel consisted of prefield, field, and report preparation phases in 1985 and 1986. Prefield studies included library research, along with examination of Lincoln County and BLM mining and mineral lease records and USBM and other production records.

The field study involved air and ground reconnaissance for deposits of decorative stone within and adjacent to the WSA at localities which appeared promising on aerial photographs. One area with a high concentration of decorative stone was examined. A representative sample of stone, suitable for use as decorative veneer, was taken. The sample was cut into a cube with a rock saw, and volume was determined. Apparent density was calculated by dividing the weight of the sample by volume.

ACKNOWLEDGMENTS

Larry Dee, geologist, BLM Shoshone District, provided aerial photographs and historical data on mining of decorative stone in the region.

GEOLOGIC SETTING

Sand Butte WSA is in the eastern Snake River Plain section of the Columbia Intermontane province, commonly known as the Columbia Plateau

(Thornbury, 1965, p. 442, fig. 23.2). The style of volcanism exhibited in the eastern Snake River Plain was described by Greeley (1982, p. 407) as "... gradational between flood basalt volcanism . . . and Hawaiian volcanism" The only rock type exposed within the WSA is Pleistocene basaltic lava (LaPoint, 1977; Rember and Bennett, 1979).

A photogeologic map of the eastern Snake River Plain, compiled by LaPoint (1977), shows three of the five lava units of the Snake River Group exposed within the Sand Butte WSA. The lavas appear to have been extruded from nearby vents; including Sand Butte, Monument Butte, Wildhorse Butte (2.5 mi east of West Wildhorse Lake), and possibly from Broken Top Butte (1.5 mi north of Sand Butte) (fig. 2). The lavas form a complex of overlapping flows which dip gently to the southwest. Flow features include a network of plateaus, pressure ridges, and collapse depressions with pahoehoe 2/ or aa 3/ surfaces. Other typical features include ropey structures, squeeze-ups, fractures, lava tubes and tunnels, blisters, spatter cones and ramparts, and minor cinder cones.

MINERALIZED AREAS

About two tons of slab pahoehoe, suitable for use as decorative stone, are distributed within one acre near the northeastern boundary of the WSA (blackened areas, fig. 2). Several more tons, covered by a thin layer of loess, may occur nearby. The pahoehoe is part of a lava flow from Sand Butte which repeatedly overflowed the banks of its channel and formed 1 1/2- to 6-in.-thick layers of basalt.

The pahoehoe is of a variety known as "Idaho Moss" that is mined from other localities in southern Idaho and marketed in the northwestern United States for about \$125/ton retail (Moyle and Winters, 1985, p. 11 and 12). It has a relatively low apparent density due to numerous gas cavities (a representative sample from the WSA has a weight of 123 pounds per cubic foot); a fair percentage has slab-like dimensions (1 to 3 in. thick and 8 or more inches in diameter) and breaks with blunt or squared edges. The top surface has a frothy texture and, if weathered, may be partially covered with lichen or moss; the undersides commonly show drip features or casts of the underlying flows. Slab pahoehoe is in demand as a veneer for the interior or exterior of buildings because its light weight and slab-like dimensions ease handling and give large coverage per ton (70 to 120 square feet); its surface texture and light weight help it stick to mortar; either side of the slabs can be used for decorative effect; its earth-tone colors are in vogue; and the numerous gas cavities in the stone have an insulating effect.

2/ Pahoehoe: Hawaiian for basaltic lava flows with a smooth, billowy, or ropey surface.

3/ Aa: Hawaiian for rough, jagged lava flows with a clinkery surface.

Slab pahoehoe was the only mineral resource identified during the survey. There are no mines, prospects, or claims in the WSA.

APPRAISAL OF MINERAL RESOURCES

The quantity of decorative stone is much too small to be mined commercially; however, the deposits may be of value to consumers who gather stone for direct use. Mining would include a search for stone of suitable dimensions which is naturally detached from the underlying flows or which can be pried or broken loose with simple tools and loaded onto a vehicle. Access to the sites is facilitated by a nearby road.

The U.S. Geological Survey (1980) has identified an area which includes the WSA as prospectively valuable for oil and gas. There are no oil and gas leases or applications within the WSA, and no known exploration has been done.

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